



IFW

Docket No.: 0171-1289PUS1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Mikio KASAI et al.

Application No.: 10/585,757

Confirmation No.: 6043

Filed: July 12, 2006

Art Unit: N/A

For: AMINOQUINOXALINE COMPOUND,  
POLYAMINOQUINOXALINE COMPOUND,  
AND USE THEREOF

Examiner: Not Yet Assigned

**LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Subsequent to the filing of the above-identified application on July 12, 2006, attached hereto is an English translation of the International Preliminary Examination Report (Form PCT/IPEA/409) that should be made of record in the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any

Application No.: 10/585,757

Docket No.: 0171-1289PUS1

additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: February 2, 2007

Respectfully submitted,

By 

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Registration No.: 42,874

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Attachment(s)

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

KOJIMA, Takashi  
GINZA OHTSUKA Bldg.2F, 16-12, Ginza 2-chome,  
Chuo-ku, Tokyo  
1040061  
JAPON

**RECEIPT  
ACKNOWLEDGED**

2006, 11, 09

**IMPORTANT NOTIFICATION**

Date of mailing (day/month/year) 26 October 2006 (26.10.2006)	
Applicant's or agent's file reference FAP-4065	
International application No. PCT/JP2005/000209	International filing date (day/month/year) 12 January 2005 (12.01.2005)
Applicant NISSAN CHEMICAL INDUSTRIES, LTD. et al	

**1. Transmittal of the translation to the applicant.**☐

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).

☒

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

EP, KR

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

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**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>FAP-4065</b>	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. <b>PCT/JP2005/000209</b>	International filing date (day/month/year) <b>12.01.2005</b>	Priority date (day/month/year) <b>13.01.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>C07D241/44, 409/04, C08G73/02, H05B33/14, 33/22 // H01M14/00</b>		
Applicant <b>NISSAN CHEMICAL INDUSTRIES, LTD.</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/000209

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:

- ☐ international search (Rule 12.3 and 23.1(b))  
☐ publication of the international application (Rule 12.4)  
☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☐ the description:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the drawings:

sheets \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	6-9, 14, 16-20, 22-24	YES
	Claims	1-5, 10-13, 15, 21, 25-34	NO
Inventive step (IS)	Claims		YES
	Claims	1-34	NO
Industrial applicability (IA)	Claims	1-34	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
Document 1: EP 1361244 A1 (Nissan Chemical Industries Ltd.), 12 November 2003			
Document 2: C. CHEN et al., "Tissue schizonticide of malaria parasite: synthesis of derivatives of 2-substituted phenoxyprimaquine, 4-methylprimaquine and quinoxaline," Yaoxue Xuebao, 1992, Vol. 27, No. 6, pages 418 to 422			
Document 3: JP 7-70306 A (Idemitsu Petrochemical Co., Ltd.), 14 March 1995			
Document 4: JP 11-506123 A (Pfizer Inc.), 02 June 1999			
Document 5: JP 2000-509730 A (Pfizer Inc.), 02 August 2000			
Document 6: JP 2003-55351 A (Air Products and Chemicals, Inc.), 26 February 2003			
Document 7: Database CAPLUS on STN, AN 1997:615604, DN 127:293190, K. NOWAK et al., "Mass spectra of selected aminopicrylazanaphthalenes," Czasopismo Techniczne (Krakow), 1996, Vol. 93, No. 6, pages 22 to 28			
Document 8: K. A. THOMAS et al., "An electrochemical, spectroscopic, and theoretical study of poly(2, 3-diaminophenazine)," Journal of			

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Electroanalytical Chemistry, 2001, Vol. 501,  
No. 1-2, pages 235 to 240

## Document 1

The inventions set forth in claims 1 to 5, 10 to 13, 21 and 25 to 34 lack novelty and do not involve an inventive step in the light of document 1 cited in the international search report. In addition, the inventions set forth in claims 6 to 9, 14 to 20 and 22 to 24 do not involve an inventive step in the light of the document in question.

Document 1 discloses 5-aminoquinoxaline derivatives and poly(5-aminoquinoxaline) compounds that are prepared from said derivatives. Therein, document 1 also indicates that the poly(5-aminoquinoxaline) compounds in question are useful in films, in electrochromic elements, in semiconductors, in solar cells, in organic electroluminescent elements and as non-linear organic materials.

Such being the case, it would have been easy for a person skilled in the art to conceive of substituting a range of similar compounds for the 5-aminoquinoxaline derivatives in question or of substituting ranges of similar groups for some of the substituent groups therein in an attempt to provide other polymers that are also useful in films, in electrochromic elements, in semiconductors, in solar cells, in organic electroluminescent elements and as non-linear organic materials.

Meanwhile, the description of the present application only presents specific production examples for a portion of the extremely wide range of compounds



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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

included within the scope of the general formula set forth in the claims. Furthermore, the description does not include any disclosure sufficient for it to be possible to confirm whether the compounds that are specifically disclosed therein actually exhibit any advantageous effect with regards to the heat resistance characteristics, the dissolution characteristics, the electric potential control characteristics or the coloration characteristics thereof in comparison to compounds that are well known in the prior art. Such being the case, the effects exhibited by the inventions set forth in claims 1 to 34 cannot be considered to be especially prominent or difficult for a person skilled in the art to have predicted in the light of the invention disclosed in document 1.

## Document 2

The invention set forth in claim 1 lacks novelty and does not involve an inventive step in the light of document 2 cited in the international search report.

Document 2 presents the compounds that are represented by formula (IV) (refer to page 418).

## Document 3

The invention set forth in claim 1 lacks novelty and does not involve an inventive step in the light of document 3 cited in the international search report.

Document 3 discloses 5-aminoquinoxaline compounds (refer to paragraph [0025]).

## Document 4

The invention set forth in claim 1 lacks novelty



Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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and does not involve an inventive step in the light of document 4 cited in the international search report.

Document 4 discloses 5-amino-6,7-dichloro-2,3-dimethoxyquinoxaline compounds; N-acetyl derivatives thereof; 5-amino-6-methyl-7-chloro-2,3-dimethoxyquinoxaline compounds; and 5-amino-6-chloro-7-methyl-2,3-dimethoxyquinoxaline compounds (refer to pages 74, 103 and 138).

Document 5

The invention set forth in claim 1 lacks novelty and does not involve an inventive step in the light of document 5 cited in the international search report.

Document 5 discloses 5-amino-6,7-dichloro-2,3-dimethoxyquinoxaline compounds (refer to page 24).

Document 6

The invention set forth in claim 1 lacks novelty and does not involve an inventive step in the light of document 6 cited in the international search report.

Document 6 discloses 7-methoxy-5-aminoquinoxaline compounds (refer to paragraph [0004]).

Document 7

The invention set forth in claim 1 lacks novelty and does not involve an inventive step in the light of document 7 cited in the international search report.

Document 7 presents N-(2,4,6-trinitrophenyl)-5-aminoquinoxaline compounds; 2-methyl-N-(2,4,6-trinitrophenyl)-5-aminoquinoxaline compounds; and 2,3-dimethyl-N-(2,4,6-trinitrophenyl)-5-aminoquinoxaline compounds.

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Document 8

The invention set forth in claim 15 lacks novelty and does not involve an inventive step in the light of document 8 cited in the international search report.

Document 8 presents 1,2-dimers of 2,3-diaminophenazine compounds (refer to page 237).

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The scopes of formulae (1a), (1b), (1c) and (1d) set forth in the claims involve a very large number of compounds. However, only an extremely small portion of the compounds in question are fully supported by the description in the meaning of PCT Article 6 or are disclosed in the meaning of PCT Article 5.